

**IN THE CLAIMS**

✓ Please make the following claim substitutions:

1        1. (Currently amended) A system for bi-directional transmission of  
2        optical signals over a single optical medium coupled between at least two nodes,  
3        said system utilizing a first optical transmission band for signals traveling in a first  
4        direction and a second optical transmission band for signals traveling in a second  
5        direction, said system comprising:

6                at least a first combiner/separator unit at a first of said two nodes, said first  
7        combiner/separator including an input port, an output port and a bi-directional  
8        input/output port for coupling to said single optical medium, a first optical filter  
9        within said first combiner/separator unit coupled to each of said ports therein,  
10        said first optical filter being substantially transmissive to optical signals of said  
11        first band entering said input port and exiting on said bi-directional input/output  
12        port and said first optical filter being substantially reflective for signals of said  
13        second band entering said bi-directional input/output port and exiting on said  
14        output port; and

15                at least a second combiner/separator unit at a second of said two nodes,  
16        said second combiner/separator including an input port, an output port and a bi-  
17        directional input/output port coupled to said optical medium, a second optical  
18        filter within said second combiner/separator unit coupled to each of said ports  
19        therein of said second combiner /separator unit, said second optical filter being  
20        substantially transmissive to optical signals of said second band entering said  
21        input port and exiting on said bi-directional input/output port and said second  
22        optical filter being substantially reflective for signals of said first band entering  
23        said bi-directional input output port and exiting on said single direction output  
24        port,

25                wherein said first optical filter and said second optical filter are in an  
26        alternating arrangement.

1        2. (Original) The system of Claim 1, further including at least one  
2        intermediate node, said intermediate node comprising:

3           at least one said first combiner/separator unit and at least one second  
4    combiner/separator unit, and

5           at least a first and second optical amplifier, said output port of said first  
6    combiner/separator unit coupled to said input port of said second  
7    combiner/separator unit through said first optical amplifier, said output port of  
8    said second combiner/separator unit coupled to said input port of said first  
9    combiner/separator unit through said second optical amplifier;

10          said first and second combiner/separator units being alternately coupled  
11    within said bi-directional transmission system such that pairs of said first and  
12    second combiner/separator units are utilized in combination, said bi-directional  
13    ports of said combiner/separator units being coupled to one another.

1           3. (Original) The system of Claim 1, wherein said optical transmission  
2    bands are L-band and C-band.

1           4. (Currently amended) The system of Claim 1, wherein said first node  
2    includes a first set of one or more optical translator units for translating received  
3    wavelengths to wavelengths of said first transmission band, said optical  
4    translator units being coupled to an optical multiplexer unit and said optical  
5    multiplexer unit being coupled to said input port of said first combiner/separator  
6    unit;

7           said output port of said first combiner/separator unit coupled to an optical  
8    demultiplexer unit, said optical demultiplexer unit coupled to a second set of  
9    optical translator units for translating wavelengths of said second transmission  
10   band to said received wavelengths.

1           5. (Original) The system of Claim 4, wherein said first node further  
2    includes at least one optical amplifier coupled between an output of said  
3    multiplexer and said input port of said first combiner/separator unit and at least  
4    one optical amplifier coupled between said output port of said first  
5    combiner/separator unit and an input of said demultiplexer.

1           6. (Original) The system of Claim 1, wherein said second node includes a  
2    first set of one or more optical translator units for translating received

3 wavelengths to wavelengths of said second transmission band, said optical  
4 translator units being coupled to an optical multiplexer unit and said optical  
5 multiplexer unit being coupled to said input port of said second  
6 combiner/separator unit;

7 said output port of said second combiner/separator unit coupled to an  
8 optical demultiplexer unit, said optical demultiplexer unit coupled to a second set  
9 of optical translator units for translating wavelengths of said first transmission  
10 band to said received wavelengths.

1 *BB*  
2 7. (Original) The system of Claim 6, wherein said second node further  
3 includes at least one optical amplifier coupled between an output of said  
4 multiplexer and the input port of said second combiner/separator unit and at least  
5 one optical amplifier coupled between said output port of said  
combiner/separator unit and an input of said demultiplexer.

1 8. (Original) The system of Claim 1, wherein said filters included in each  
2 of said first and second combiner/separator units are thin film wide-band filters.

1 9. (Currently amended) The system of Claim 3, wherein said C-band  
2 and L-band filters include a transmissive insertion loss in the range of 1.3 to 1.7  
3 dB and reflective insertion loss in the range of 0.3 to 0.9 dB.

1 10. (Canceled)

1 11. (Canceled)

1 12. (Currently amended) A system for bi-directional transmission of optical  
2 signals over a single optical fiber, said system including at least two nodes  
3 having said optical fiber coupled therebetween, said system utilizing only two  
4 distinct optical transmission bands, a single one of said bands for transmission of  
5 said optical signals in one of two directions, the other of said bands for  
6 transmission of said optical signals in the opposite direction, said system  
7 comprising:

8 at least a first and second combiner/separator unit, at least one  
9 combiner/separator unit located at each of said two nodes, each said

10 combiner/separator unit including an input port, an output port and a bi-  
11 directional input/output port for coupling to said single optical fiber, an optical  
12 filter within said combiner/separator units coupled to each of said ports, each  
13 said combiner/separator unit operable to direct optical signals entering said input  
14 port through said optical filter to said bi-directional input/output port and to reflect  
15 optical signals entering said bi-directional input/output port off of said optical filter  
16 to said output port;

17 said optical filter in said first combiner/separator unit being substantially  
18 transmissive to a first of said two bands and substantially reflective to optical  
19 signals in said second band traveling in an opposite direction;

20 said optical filter in said second combiner/separator unit being  
21 substantially transmissive to signals in said second band and substantially  
22 reflective for signals of said first band traveling in an opposite direction; and

23 said first and second combiner/separator units being alternately coupled  
24 within said bi-directional transmission system such that pairs of said first and  
25 second combiner/separator units are utilized in combination, said bi-directional  
26 ports of said combiner/separator units being coupled to one another,

27 wherein said optical filter in said first combiner/separator unit and said  
28 optical filter in said second combiner/separator unit are in an alternating  
29 arrangement.

1 13. (Original) The system of Claim 12, further including at least one  
2 intermediate node, said intermediate node comprising:

3 at least one said first combiner/separator unit and at least one second  
4 combiner/separator unit, and

5 at least a first and second optical amplifier, said output port of said first  
6 combiner/separator unit coupled to said input port of said second  
7 combiner/separator unit through said first optical amplifier, said output port of  
8 said second combiner/separator unit coupled to said input port of said first  
9 combiner/separator unit through said second optical amplifier.

1 14. (Original) The system of Claim 12, wherein an end node in said  
2 system includes either a first or second combiner/separator unit, said end node

3 further including a first set of one or more optical translator units for translating  
4 received wavelengths to wavelengths of one of said two distinct transmission  
5 bands, said optical translator units being coupled to an optical multiplexer unit  
6 and said optical multiplexer unit being coupled to said input port of said  
7 combiner/separator unit; and

8 said output port of said combiner/separator unit coupled to an optical  
9 demultiplexer unit, said optical demultiplexer unit coupled to a second set of  
10 optical translator units for translating wavelengths of said other of said two  
11 transmission bands to said received wavelengths.

15. (Original) The system of Claim 14, wherein said end node further  
includes at least one optical amplifier coupled between an output of said  
multiplexer and the input port of said combiner/separator unit and at least one  
optical amplifier coupled between said output port of said combiner/separator unit  
and an input of said demultiplexer.

16. (Original) The system of Claim 12, wherein said filters included in each  
2 of said first and second combiner/separator units are thin film wide-band filters.

17. (Canceled)

18. (Original) The system of Claim 12, wherein said transmission bands  
2 are selected from the group consisting of L-band/C-band, C-band/S-band, C1  
3 band/C2 band and S-band/L-band.

19. (Canceled)

20. (Canceled)

21. (Currently amended) A method for bi-directional transmission of optical  
signals over a single optical fiber coupled between two nodes, said method  
utilizing only two distinct optical transmission bands, a single one of said bands  
for transmission of said optical signals in one of two directions, the other of said  
bands for transmission of said optical signals in the opposite direction, said  
method comprising:

7 providing at least a first and second combiner/separator unit, at least one  
8 combiner/separator unit located at each of said two nodes, said  
9 combiner/separator units each including an input port, an output port and a bi-  
10 directional input/output port for coupling to said single optical fiber, an optical  
11 filter within said combiner/separator units coupled to each of said ports, each of  
12 said combiner separator units operable to direct optical signals entering said  
13 input port through said optical filter to said bi-directional input/output port and to  
14 reflect optical signals entering said bi-directional input/output port off of said  
15 optical filter to said output port,

16 said optical filter in said first combiner/separator unit being substantially  
17 transmissive to a first of said two bands and substantially reflective to optical  
18 signals in said second band traveling in an opposite direction,

19 said optical filter in said second combiner/separator unit being  
20 substantially transmissive to signals in said second band and substantially  
21 reflective for signals of said first band traveling in an opposite direction; and

22 alternately coupling said first and second combiner/separator units within  
23 said bi-directional transmission system such that pairs of said first and second  
24 combiner/separator units are utilized in combination, said bi-directional ports of  
25 said combiner/separator units being coupled to one another,

26 wherein said optical filter in said first combiner/separator unit and said  
27 optical filter in said second combiner/separator unit are in an alternating  
28 arrangement.

1 22. (Currently amended) The method of Claim 49 21, wherein said  
2 transmission bands are selected from the group consisting of: L-band/C-band, C-  
3 band/S-band, C1 band/C2 band and S-band/L-band.

1 23. (Currently amended) Apparatus, comprising:

2 means for filtering, and

3 means for transmitting a first signal in a first signal band from a first path  
4 onto an optical medium via said means for filtering, said means for filtering being  
5 substantially transmissive to signals in said first signal band and substantially

6 reflective to reflecting a second signals in a second signal band received from  
7 said optical medium onto a path separate from said first path,

8 wherein said means for filtering is adapted to be coupled in an alternating  
9 arrangement to a second means for filtering, said second means for filtering  
10 being substantially transmissive to said signals in said second signal band and  
11 substantially reflective to said signals in said first signal band.

1 24. (Previously presently) The apparatus of Claim 23, wherein one of  
2 said first and second signals is a C-band signal and the other is an L-band signal.

1 25. (Previously presently) The apparatus of Claim 23, wherein the  
2 means for transmitting said first signal comprises:

3 means for modulating, multiplexing, and amplifying a plurality of input  
4 signals to form said first signal, and

5 wherein said apparatus further connects to said optical medium.

1 26. (Previously presently) The apparatus of Claim 25, further comprising  
2 means for amplifying, demultiplexing, and demodulating said second signal.

1 27. (Previously presently) The apparatus of Claim 26, wherein the  
2 means for filtering comprises:

3 an input port for receiving said first signal from said first path,

4 a bi-directional input/output port for applying said first signal to said optical  
5 medium and for receiving said second signal from said optical medium, and

6 a reflection port for applying said second signal to said separate path.

1 28. (Currently amended) Apparatus for use in a communication system  
2 of a type in which optical signals in one a first signal band are transported in one  
3 direction along an optical transport medium and signals in a second signal band  
4 are transported in the opposite direction of said optical transport medium, said  
5 apparatus comprising:

6 a first signal path,

7 a second signal path, different from said first path, and

8           an optical filter that allows the signals traveling in said one direction to flow  
9   from said first path onto said transport medium and that reflects the signals  
10   traveling in said opposite direction onto said second path,

11           wherein said optical filter is adapted to be coupled in an alternating  
12   arrangement to a second optical filter, said second optical filter allows said  
13   signals in said second signal band to flow onto said transport medium and  
14   reflects said signals in said first signal band.

1           29. (Currently amended)   The invention apparatus of Claim 28 wherein:  
2           said first signal path includes means for multiplexing and amplifying a  
3   plurality of input signals to form said signals traveling in said one direction,  
4           said signals traveling in said opposite direction include a plurality of  
5   multiplexed incoming signals, and  
6           said second signal path includes means for demultiplexing and amplifying  
7   said multiplexed incoming signals.

1           30. (Currently amended)   The invention apparatus of Claim 29, wherein  
2   one of said signal bands is the C band and the other of said signal bands is the L  
3   band.

1           31. (New) The system of Claim 18, wherein said C-band and L-band filters  
2   include a transmissive insertion loss in the range of 1.3 to 1.7 dB and reflective  
3   insertion loss in the range of 0.3 to 0.9 dB.